

**TEXTILE PRINTING METHOD AND DEVICE THEREFOR**

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**Abstract**

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**PURPOSE:** To provide a textile printing method and device therefor capable of dealing with needs such as various products and a short delivery period.

**CONSTITUTION:** This textile printing device is constituted by providing a conveying means (1) for continuously conveying a lengthy cloth (F), a supplying means (30) for supplying the cloth (F) to the conveying means (1), a printing means having a printing plate (10) and a printing means without having the printing plate (20) installed along the cloth (F) conveying passage of the conveying means (1) and a discharging means (40) for discharging the cloth (F) from the conveying means (1) after printing. The printing means without having the printing plate (20) is constituted by providing an ink-jet head (23) injecting ink droplets, a transferring mechanism transferring the ink-jet head (23) in the width direction of the cloth (F), a memorization means for memorizing the data of colors and patterns for a printing and a regulating means for regulating the functioning of the ink-jet head (23) and the transferring mechanism based on the data of colors and patterns for the printing.

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(54) 【発明の名称】 捺染方法および装置

(57) 【特許請求の範囲】

【請求項1】 搬送ベルトを備えた搬送手段により長尺布帛を連続的に走行せしめて該布帛に色柄を捺染する方法であって、捺染用版を用いて該布帛に色柄を捺染する有版捺染工程と、該有版捺染後の布帛にインクジェットノズルよりインク滴を噴射して色柄を捺染する無版捺染工程の各工程を備えてなる布帛の捺染方法。

【請求項2】 前記搬送ベルトに位置調整用マークを設け、有版捺染工程において前記位置調整用マークに合わせて色柄を捺染するとともに、前記無版捺染工程においては前記位置調整用マークの位置を検出し、該マーク位置を基に前記インクジェットノズルの位置を調整し、捺染する請求項1記載の布帛の捺染方法。

【請求項3】 前記有版捺染工程において前記布帛に色柄を捺染するとともに、位置調整用マークを布帛又は搬

送ベルトに捺染し、ついで前記無版捺染工程において該位置調整用マークの位置を検出し、該マーク位置を基に前記インクジェットノズルの位置を調整し、捺染する請求項1記載の布帛の捺染方法。

【請求項4】 搬送ベルトを備え、該搬送ベルトにより長尺布帛を連続的に搬送する搬送手段と、該搬送手段に布帛を供給する供給手段と、前記搬送手段の布帛搬送経路に沿って設けた有版捺染手段及び無版捺染手段と、捺染後の布帛を前記搬送手段より排出せしめる排出手段とからなり、前記無版捺染手段が、インク滴を噴出せしめるインクジェットヘッドと、該インクジェットヘッドを搬送布帛の幅方向に移動せしめる移動機構と、捺染の色柄データを記憶した記憶手段と、該色柄データを基に前記インクジェットヘッド及び移動機構の作動を制御する制御手段とを備えた布帛捺染装置。

【請求項5】 前記搬送ベルトが位置調整用マークを備え、前記無版捺染手段が、該位置調整用マークを検知する読取手段と、前記インクジェットヘッド及び移動機構を搬送布帛の長手方向に移動せしめる調整手段とを備え、前記制御手段が、前記読取手段より入力したデータを処理し、前記調整手段の作動を制御する調整手段駆動部を備えた請求項4記載の布帛捺染装置。

【請求項6】 前記搬送ベルトの搬送方向に沿って前記有版捺染手段を上手側に、前記無版捺染手段を下手側に配設するとともに、前記有版捺染手段が位置調整用マーク捺染部を備え、前記無版捺染手段が、捺染した位置調整用マークを検知する読取手段と、前記インクジェットヘッド及び移動機構を搬送布帛の長手方向に移動せしめる調整手段とを備え、前記制御手段が、前記読取手段より入力したデータを処理し、前記調整手段の作動を制御する調整手段駆動部を備えた請求項4記載の布帛捺染装置。

【請求項7】 前記制御手段が、前記読取手段より入力したデータを処理し、該データに基づいて前記インクジェットヘッド及び移動機構の作動を制御し、前記布帛の幅方向における捺染位置を調整する幅方向調整部を備えた請求項5又は6記載の布帛捺染装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、布帛の仕上げ加工である捺染方法及びその装置に関する。

【0002】

【従来の技術】従来の布帛に対して捺染する方法及び装置としては、繊維便覧（編者：繊維学会、発行所：丸善株式会社）に見られるような、ローラ捺染機等の凹版形式、スクリーン捺染機等の孔版形式等の捺染用の版を備えた有版捺染機と、出願人が既に特願平2-217359号、特願平2-340724号、特願平3-88545号等において開示した無版捺染機が知られている。

【0003】前者のローラ捺染機は、布帛を太鼓の外周面に沿わせて搬送し、その周辺に配設した凹版彫刻ローラと前記太鼓間の押圧によって凹版彫刻ローラの捺染のりを布帛上に転移捺染するというものである。

【0004】また、スクリーン捺染機は更にフラットスクリーン捺染機とロータリスクリーン捺染機に分類されるが、いずれのものも、多色で描かれている原画を色分解し、各色毎の柄を明確にし、各色毎に作成したスクリーン版型を用いて捺染するというものである。このスクリーン版型の形状が平型のものをフラットスクリーン捺染機といい、円筒型のものをロータリスクリーン捺染機という。そして、フラットスクリーン捺染機は布帛をエンドレスベルト上に接着してベルトとともに移動させ、ベルト上方に並設した平型スクリーン版型に捺染のりを供給し、スqueegeeによって捺染のりをスクリーン型から通し、布帛上に捺染するという機構を備えたものであ

り、ロータリスクリーン捺染機は、前記ローラ捺染機と同様に、布帛を太鼓の外周面に沿わせて搬送し、その周辺に配設した円筒状スクリーン捺染型の内部に供給した捺染のりを、ローラ型のスqueegeeを操作することによってスクリーン捺染型から通し、布帛上に捺染するという機構を備えたものである。

【0005】而して、これら有版の捺染機によれば高速に布帛上に捺染することができ、生産性の高い捺染を行うことができる。

【0006】一方、後者の無版捺染機は、布帛をエンドレスベルト上に接着してベルトとともに移動させ、複数色に対応した各インクジェットヘッドのノズルから染料を噴射せしめて布帛上に捺染するという機構を備えたものであり、前記インクジェットヘッドは搬送される布帛の幅方向に走査せしめられるもの、或いは、布帛の全幅をカバーするように、複数個を並設したものがある。そして、この装置によれば、スクリーン捺染機では表現出来ない、多数色を表現できるとともに、微細な柄を表現できる。

【0007】

【発明が解決しようとする課題】ところが前述の従来の捺染機は以下に説明する不利な点を有していた。即ち、有版の捺染機にあつては、生産性が高いという長所を有する反面、①製版に日数を要するという欠点、②微細な柄を表現できないという欠点、③表現色に制限があるという欠点を有していた。そして、かかる欠点は、顧客の短納期の要請、或いは趣味感の多様化した顧客からの多様なニーズに対応できないという結果を招来していた。一方、後者の無版捺染機にあつては、無版であるが故に短納期であり、多様且つ微細な捺染を行うことができるという長所を有する反面、捺染に時間を要する、即ち、生産性が低いという欠点を有していた。このことは結果として、多量製品の短納期化に対する制約となっていた。

【0008】本発明は、以上の実状に鑑みなされたものであつて、多様な製品、短納期というニーズに対応し得る捺染方法及び装置の提供を目的とする。

【0009】

【課題を解決するための手段】上記目的を達成するための請求項1に係る発明は、搬送ベルトを備えた搬送手段により長尺布帛を連続的に走行せしめて該布帛に色柄を捺染する方法であつて、捺染用版を用いて該布帛に色柄を捺染する有版捺染工程と、該有版捺染後の布帛にインクジェットノズルよりインク滴を噴射して色柄を捺染する無版捺染工程の各工程を備えてなることを要旨とし、請求項2に係る発明は、請求項1の発明において、前記搬送ベルトに位置調整用マークを設け、有版捺染工程において前記位置調整用マークに合わせて色柄を捺染するとともに、前記無版捺染工程においては前記位置調整用マークの位置を検出し、該マーク位置を基に前記インク

ジェットノズルの位置を調整し、捺染することを要旨とする。尚、前記有版捺染工程、無版捺染工程を実施する態様は、有版捺染工程を実施した後に無版捺染工程を実施する或いは、無版捺染工程を実施した後に有版捺染工程を実施するいずれの態様であっても良い。

【0010】請求項3に係る発明は、請求項1の発明において、前記有版捺染工程において前記布帛に色柄を捺染するとともに、位置調整用マークを布帛又は搬送ベルトに捺染し、ついで前記無版捺染工程において該位置調整用マークの位置を検出し、該マーク位置を基に前記インクジェットノズルの位置を調整し、捺染することを要旨とする。

【0011】また、請求項4に係る発明は装置の発明であって、搬送ベルトを備え、該搬送ベルトにより長尺布帛を連続的に搬送する搬送手段と、該搬送手段に布帛を供給する供給手段と、前記搬送手段の布帛搬送経路に沿って設けた有版捺染手段及び無版捺染手段と、捺染後の布帛を前記搬送手段より排出せしめる排出手段とからなり、前記無版捺染手段が、インク滴を噴出せしめるインクジェットヘッドと、該インクジェットヘッドを搬送布帛の幅方向に移動せしめる移動機構と、捺染の色柄データを記憶した記憶手段と、該色柄データを基に前記インクジェットヘッド及び移動機構の作動を制御する制御手段とを備えたことを要旨とし、請求項5に係る発明は請求項4における前記搬送ベルトが位置調整用マークを備え、前記無版捺染手段が、該位置調整用マークを検知する読取手段と、前記インクジェットヘッド及び移動機構を搬送布帛の長手方向に移動せしめる調整手段とを備え、前記制御手段が、前記読取手段により入力したデータを処理し、前記調整手段の作動を制御する調整手段駆動部を備えたことを要旨とする。尚、前記有版捺染手段、無版捺染手段を設ける態様は、前記有版捺染手段を上手側に、前記無版捺染手段を下手側にそれぞれ設けた或いは、前記無版捺染手段を上手側に、前記有版捺染手段を下手側にそれぞれ設けたいずれの態様であっても良い。

【0012】また、請求項6に係る発明は、請求項4の発明における前記搬送ベルトの搬送方向に沿って前記有版捺染手段を上手側に、前記無版捺染手段を下手側に配設するとともに、前記有版捺染手段が位置調整用マーク捺染部を備え、前記無版捺染手段が、捺染した位置調整用マークを検知する読取手段と、前記インクジェットヘッド及び移動機構を搬送布帛の長手方向に移動せしめる調整手段とを備え、前記制御手段が、前記読取手段により入力したデータを処理し、前記調整手段の作動を制御する調整手段駆動部を備えたことを要旨とする。

【0013】また、請求項7に係る発明は、請求項5又は6の発明における前記制御手段が、前記読取手段より入力したデータを処理し、該データに基づいて前記インクジェットヘッド及び移動機構の作動を制御し、前記布

帛の幅方向における捺染位置を調整する幅方向調整部を備えたことを要旨とする。

【0014】

【作用】次に、以上の構成を備えた本発明の作用について説明する。最初に、請求項1及び4の発明の作用について説明する。当該請求項1及び4の発明によれば、まず、長尺の布帛を供給手段により搬送手段に供給して、当該搬送手段の搬送ベルトにより前記布帛をまず有版捺染工程について無版捺染工程に、或いはまず無版捺染工程について有版捺染工程に搬送する。而して、有版捺染工程において有版捺染手段により布帛に捺染を施し、無版捺染工程において無版捺染手段の制御手段が記憶手段に記憶した色柄データを基にインクジェットヘッド及び移動機構を駆動し、インクジェットノズルよりインク滴を当該布帛に噴射せしめて捺染する。ついで、捺染後の布帛を排出手段により搬送手段から排出する。尚、色数の少ない大柄の部分の有版捺染手段により捺染し、色数の多い小柄の部分の無版捺染手段により捺染すれば、無版捺染手段のみにより捺染する場合に比べて生産性が格段に向上する。また、より少ない日数で捺染用版を製作することができる。更に、大柄の捺染用版を共通使用し、小柄である無版捺染部の記憶手段に記憶している色柄データのみを変化させて多種類の色柄を捺染すれば、更に生産性が向上するとともに、顧客の短納期の要請に十分に応えることができる。

【0015】次に、請求項2及び5の発明の作用について説明する。当該請求項2及び5の発明によれば、搬送ベルトに位置調整用のマークを設け、有版捺染工程においては、当該位置調整マークに合わせて色柄を捺染する。一方、無版捺染工程においては、無版捺染手段の読取手段により当該マークを検知し、当該検知データを制御手段の調整手段駆動部に入力する。当該調整手段駆動部においては入力した検知データを処理し、当該位置調整マークの布帛長手方向における位置ずれを検出し、前記調整手段を駆動してずれ量分だけインクジェットヘッド及び移動機構を搬送布帛の長手方向に移動せしめ、有版捺染柄に対するインクジェットヘッドの位置を修正する。これにより、有版捺染柄に対する無版捺染柄の前記長手方向の位置関係を常に正常に保って捺染することができる。

【0016】更に、請求項3及び6の発明によれば、まず有版捺染工程において、捺染版を用いて色柄を捺染するとともに、位置調整用マーク捺染部により布帛に位置調整用マークを捺染する。尚、前記色柄と位置調整用マークとは一定の位置関係にある。ついで、無版捺染工程において、読取手段により前記位置調整用マークを検知し、当該検知データを制御手段の調整手段駆動部に入力する。当該調整手段駆動部においては入力した検知データを処理し、当該位置調整マークの布帛長手方向における位置ずれを検出し、前記調整手段を駆動してずれ量分

だけインクジェットヘッド及び移動機構を搬送布帛の長手方向に移動せしめ、有版捺染柄に対するインクジェットヘッドの位置を修正する。これにより、有版捺染柄に対する無版捺染柄の前記長手方向の位置関係を常に正常に保って捺染することができる。

【0017】また、請求項7の発明によれば、請求項5及び6の発明におけるインクジェットヘッド及び移動機構の長手方向の位置調整とともに、当該インクジェットヘッド及び移動機構の搬送布帛幅方向の位置調整を行う。即ち、前記制御手段内の幅方向調整部により前記読取手段からのデータを処理し、前記位置調整用マークの前記幅方向の位置を検出する。ついで、前記幅方向調整部は前記インクジェットヘッドよりインク滴を噴射する前記幅方向の原点位置が前記位置調整用マークとの正常な位置関係から何位ずれているかを算出し、当該ずれ量だけ前記原点位置を修正する。これにより、有版捺染柄に対する無版捺染柄の前記幅方向の位置関係を常に正常に保って捺染することができる。

【0018】

【実施例】以下、本発明の実施例を添付図面に基づき説明する。図1は本発明の一実施例を示す正面図である。図1に示すように、実施例装置は供給装置(30)と、搬送装置(1)と、有版捺染部(10)と、無版捺染部(20)と、排出装置(40)と、各装置の作動を制御する制御装置(図示せず)とからなる。

【0019】前記搬送装置(1)は、図1に示すように、所定の間隔を隔てて並設した搬送ローラ(2)、(2)と、該搬送ローラ(2)を間欠駆動させる駆動モータ(図示せず)と、該搬送ローラ(2)の回転移動量を検出するセンサ(7)とからなる。尚、この搬送装置(1)はロータリエンコーダ等のセンサ(7)を備えており、前記駆動モータ(図示せず)の駆動を厳密に制御することができる。そして、前記搬送ベルト(3)の下部には、布帛(F)を通過し搬送ベルト(3)上に残された染料を洗い流す洗浄装置(8)と、搬送ベルト(3)に接着剤を塗布する糊付け装置(9)とを設けている。

【0020】前記供給装置(30)は、ロール状に巻かれた布帛(F)の巻き取り軸を、軸中心に回転自在に支持する繰り出し装置(31)と、布帛(F)の張力を一定に保つダンサバ(32)と、布帛(F)の蛇行を防止して前記搬送ベルト(3)に導くガイドローラ(33)と、間欠駆動する搬送ベルト(3)と一定速度にて供給される布帛(F)の速度差を吸収する同期機構(34)、(35)と、布帛(F)及び搬送ベルト(3)を挟んで搬送ローラ(2)、(2)に当接し、布帛(F)を搬送ベルト(3)に貼着する貼着ローラ(36)とを備えてなるものであり、貼着ローラ(36)及びガイドローラ(33)をそれぞれ回転自在に設けている。

【0021】前記有版捺染部(10)は、図1に示す如

く、布帛(F)の搬送方向に並設した複数のスクリーン版型(11)と、図2に示した、スクリーン版型(11)を支持し、当該スクリーン版型(11)を上下動せしめる上下駆動手段(13)と、この上下駆動手段(13)を支持する支持手段(12)と、前記スクリーン版型(11)上面に接触して矢示G-H方向に移動するスケージ(15)とを備えてなる。そして、前記上下駆動手段(13)はエアシリンダ若しくは油圧シリンダよりなり、前記スケージ(15)は別途設けたエアシリンダ若しくは油圧シリンダにより矢示G-H方向に移動せしめられる。

【0022】前記無版捺染部(20)は、図3に示すように、インクジェットヘッド(23)と、インク貯蔵タンク(21)と、位置確認センサ(50)と、これらインクジェットヘッド(23)、インク貯蔵タンク(21)及び位置確認センサ(50)とを支持し、矢示I-J方向に移動せしめる往復移動機構(24)とを備えている。往復移動機構(24)はスライド(25)と、矢示I-J方向に移動可能な前記スライド(25)に係合したサドル(26)と、このサドル(26)を駆動するボールネジ及び駆動モータ(共に図示せず)とを備えてなる。そして、インクジェットヘッド(23)、これに対応したインク貯蔵タンク(21)及び位置確認センサ(50)を前記サドル(26)に付設している。尚、この例では、イエロー(Y)、マゼンタ(M)、シアン(C)、ブラック(K)の各色に対応した4個のインクジェットヘッド(23)を設けると共に、前記各色のインクを貯留したインク貯蔵タンク(21)を4個設け、対応関係にあるインク貯蔵タンク(21)とインクジェットヘッド(23)とを配管(22)により連結している。また、インクジェットヘッド(23)は複数のノズルを有し、当該個々のノズルを独立に噴射制御できるようになっており、前記制御装置(図示せず)からの駆動信号を受けて当該ノズルを駆動する。また、前記位置確認センサ(50)には例えばスポット型光電センサを適用でき、当該位置確認センサ(50)をサドル(26)の図示最も右側に設けている。

【0023】また、図4に示すように、スライド(25)の両端部に調整機構(27)を備えている。この調整機構(27)は前記スライド(25)に直交する方向、即ち、布帛(F)の長手方向に配設したスライド(28)と、これに係合し、矢示K-L方向に移動するサドル(29)と、このサドル(29)を駆動するボールネジ及び駆動モータ(共に図示せず)とを備えてなる。而して、この調整機構(27)を駆動することにより前記往復移動機構(24)のスライド(25)、サドル(26)、インクジェットヘッド(23)、インク貯蔵タンク(21)が矢示K-L方向に移動する。

【0024】前記制御装置(図示せず)は上述のように、前記供給装置(30)、搬送装置(1)、有版捺染

部(10)、無版捺染部(20)、排出装置(40)の各部に接続し、その作動を制御するものである。また、この制御装置(図示せず)は適宜記憶手段を有し、この記憶手段に所定の図柄を色分解したデータを記憶しており、このデータを基に変換した駆動信号をインクジェットヘッド(23)及び往復移動機構(24)に伝送し、当該インクジェットヘッド(23)を布帛(F)の幅方向に移動せしめるとともにインク滴を噴出せしめる。また、前記制御装置(図示せず)は、前記位置確認センサ(50)の検知信号を処理する処理部並びに、処理部からの信号を受けて前記位置調整機構(27)に駆動信号を出力する調整機構駆動部並びに、同様に処理部からの信号を受けて往復移動機構(24)及びインクジェットヘッド(23)に出力する駆動信号を修正する幅方向調整部を備えている。

【0025】前記排出装置(40)は、図1に示すように、剥離装置(41)と、乾燥装置(42)と、振り畳み装置(43)と、台車(44)とを備えてなる。前記剥離装置(41)はベルトコンベアからなり、これを図1に示す搬送装置(1)の右側端部上方に設けている。また、乾燥装置(42)は熱式乾燥装置であり、これを剥離装置(41)と、振り畳み装置(43)との間に設けている。また、振り畳み装置(43)は矢示D-E方向に揺動するガイドを備え、布帛(F)を矢示D-E方向に振りながら台車(44)上に落とすものである。

【0026】次に、以上の構成からなる実施例装置の作動について工程別に説明する。

【0027】(布帛供給工程)まず、糊付け装置(9)により、捺染対象の布帛(F)を貼着するための地張り剤と呼ばれる接着剤が搬送ベルト(3)の上面に均一に塗布される。一方、供給装置(30)によれば、繰り出し装置(31)から巻出された布帛(F)がダンサバー(32)により張力を一定に保たれ、ガイドローラ(33)により蛇行することなく、同期機構(34)、(35)を介して、搬送ベルト(3)上に供給される。そして、布帛(F)が貼着ローラ(36)との間を通過することによって当該布帛(F)が搬送ベルト(3)上に密着した状態で貼着される。その際、布帛(F)を過剰に張ること無く且つ皺が入らないように貼着する必要がある。

【0028】このとき、搬送ベルト(3)が間欠駆動されるのに対し、布帛(F)は一定速度で巻出されるため、搬送ベルト(3)の停止時に、貼着ローラ(36)の手前で布帛(F)が過剰供給された状態となり、弛みを生じる。そこで、同期機構(34)、(35)を矢示B-C方向に移動せしめて布帛(F)の移動速度差(即ち、弛み)を吸収する。具体的には、搬送ベルト(3)が停止している間は、同期機構(34)、(35)を矢示B方向に移動せしめ(同期機構(34)、(35)と貼着ローラ(36)とは連結しており、同期機構(3

4)、(35)が矢示B方向に移動すると貼着ローラ(36)も矢示B方向に移動する)、送られてくる布帛(F)を一定長分貯留する。逆に搬送ベルト(3)が駆動している間は、同期機構(34)、(35)を矢示C方向に移動せしめ、貯留していた布帛(F)を一気に吐き出す。尚、このように一定速度で連続的に搬送される布帛(F)を間欠駆動する搬送ベルト(3)上に供給する技術は、すでに特公昭64-7585号公報等において開示されている。

【0029】また、間欠送りされる前記搬送ベルト(3)の搬送ピッチは前記インクジェットヘッド(23)の捺染幅(布帛長手方向の幅)と同じとなっている。尚、有版捺染部(10)における捺染幅は前記インクジェットヘッド(23)の捺染幅の整数倍となっている。

【0030】(有版捺染工程)有版捺染部(10)では、前記搬送ベルト(3)が数ピッチ分(有版捺染における捺染幅分)布帛(F)を搬送した後次の動作がなされる。即ち、まず、上下駆動手段(3)を駆動してスクリーン版型(11)を下方に移動せしめて当該スクリーン版型(11)を布帛(F)上に密着させる。そしてスクリーン版型(11)上で予め一方の端に寄せられていた2枚のスケージ(15)のうち進行方向後ろ側のものが下降し、スクリーン版型(11)に密着し、布帛幅方向の1方向(例えば図2に示す矢示H方向)に移動し、スクリーン版型(11)上に予め供給された捺染のり(14)を掻く。スクリーン版型(11)には微小孔のパターンが穿孔されており、その微小孔を通過した捺染のり(14)が布帛(F)に到達し、所望の図柄が布帛(F)に捺染される。

【0031】スケージ(15)が前記移動方向端に達した後、上下駆動手段(3)を駆動してスクリーン版型(11)を上方に移動せしめ、スクリーン版型(11)を布帛(F)から剥離させる。ついで、スクリーン版型(11)と布帛(F)間に空隙ができたとき、搬送ベルト(3)を駆動し、布帛(F)を次の捺染箇所(次のスクリーン版型の下方位置)へ有版捺染幅分だけ搬送する。ついで、以上の作動を繰り返して、布帛(F)に順次捺染するのであるが、その際、布帛幅方向端に到達した後のスケージ(15)の作動について、2枚のスケージ(15)とも上方に移動させ、所定位置まで復帰せしめる方法もあるが、復路については2枚のスケージ(15)のうち往路と逆のスケージで捺染のり(14)を掻くことで、捺染の生産性を高めることも可能である。

【0032】以上のようにして、複数枚のスクリーン版型を用いて捺染することで、所望の色柄の図柄を布帛(F)に捺染することができる。尚、この有版捺染工程では色数の少ない大柄の図柄を捺染する。

【0033】(無版捺染工程)無版捺染部(20)では、前記搬送ベルト(3)の間欠駆動の1周期の間(1



ピッチ分の搬送の間)で次の動作がなされる。即ち、まず、布帛(F)が停止した状態で駆動モータ及びボールネジ(共に図示せず)を駆動し、サドル(26)をスライド(25)に沿って移動せしめる(これを走査という)。これによりインクジェットヘッド(23)が布帛(F)の幅方向に移動する。当該移動の際、インクジェットヘッド(23)は逐次、制御装置(図示せず)からの駆動信号を受けて、インク貯蔵タンク(21)から配管(22)を経由して供給されるインクを布帛(F)に噴射し、所望の図柄を捺染する。尚、このインクジェットヘッド(23)は布帛(F)の長手方向に複数のノズルを備えており、1度の走査で所定幅のライン状の捺染を行うことができる。

【0034】布帛幅方向に他端まで到達した後は、無噴射で原位置に復帰せしめる方法もあるが、制御装置が図柄パターンを鏡面对称に変換処理する機能を有していればインクジェットヘッド(23)の復路においても噴射制御を行い、捺染の生産性を高めることも可能である。このようにして、布帛(F)の幅方向にインクジェットヘッド(23)を順次走査せしめることにより、所望の図柄を捺染することができる。

【0035】また、染料・インクの色を複数用意することにより多色捺染が可能である。通常、イエロー(Y)、マゼンタ(M)、シアン(C)の3色がよく用いられる。さらにブラック(K)を加えることがある。本実施例ではインクジェットヘッド(23)、インク貯蔵タンク(21)及び配管(22)をイエロー(Y)、マゼンタ(M)、シアン(C)、ブラック(K)の各色に対応した4組備えている。尚、インクジェットヘッド(23)による捺染によれば、それぞれの噴射の軌跡が布帛(F)上でドットによる網点構造となり、細かい線、図柄を表現できるとともに、略全色について表現することができる。従って、この無版捺染工程においては、色数の多い、細かい図柄の捺染を行う。これら染料・インクを微粒滴にして噴射させるインクジェット方式については既存技術として種々の方式があり、これを採用し得る。

【0036】(排出工程)この工程ではまず、排出装置(40)の剥離装置(41)により搬送ベルト(3)上に貼着された布帛(F)を上方に引き剥がす。ついで、剥離された布帛(F)を振り畳む前に、色移りを防ぐため、乾燥装置(42)により捺染した染料に含まれる水分を除去する。そして、また、振り畳み装置(43)を矢示D-E方向に揺動させ、台車(44)上に振り畳む。

【0037】また捺染のりは、スケージで掻かれた後、一部が布帛(F)を透過し、布帛(F)と搬送ベルト(3)の間に貯留しているため、布帛が剥離されると、搬送ベルト(3)上に捺染のりが残される。搬送ベルト(3)は周回するため、次の布帛(F)の地張りに備え

て残された捺染のり(14)を洗浄装置(8)により洗浄する必要がある。具体的には温水をかけながらブラシ・スポンジで捺染のりを洗浄する。その後、糊付け装置(9)により新たに清浄な地張り剤である接着剤を搬送ベルト(3)上に均一に塗布する。

【0038】次に、有版捺染による図柄と無版捺染による図柄を合わせるための方法について説明する。

【0039】有版捺染部(10)と無版捺染部(20)とは機構が別々であるため、精密な捺染図柄を得るためには、有版捺染による図柄と無版捺染による図柄とを精密に柄合わせする必要がある。そのためには、まず、前記搬送ベルト(3)上に位置合わせ用の直角二等辺三角形のマーク(51)(図5)を設ける。一方、スクリーン版型にも合同形の直角二等辺三角形の透明なマークを設ける。そして、搬送ベルト(3)のマーク(51)にスクリーン版型のマークが合致するように、スクリーン版型をセットする。尚、スクリーン版型のマークと図柄とは一定の位置関係に設定している。

【0040】無版捺染部(20)においては、位置確認センサ(50)の読み取り位置に達した前記搬送ベルト(3)のマーク(51)を当該位置確認センサ(50)により読み取る。尚、この例では図4及び5に示すように、マーク(51)の各頂点位置に対応するように3個のスポット型センサを設けている。而して、前記制御装置(図示せず)はこの3個の位置確認センサ(50)の検知信号を入力して処理部において処理し、その結果から全ての位置確認センサ(50)がマーク(51)を検知するように、調整手段駆動部において前記調整機構(27)を駆動してインクジェットヘッド(23)の長手方向の位置を調整するとともに、幅方向調整部において往復移動機構(24)を駆動してインクジェットヘッド(23)の布帛(F)幅方向のずれ量を算出する。ついで、この幅方向調整部は算出したずれ量を基に、前記往復移動機構(24)及びインクジェットヘッド(23)の駆動を補正する。尚、前記制御装置(図示せず)の記憶手段に記憶したデータも、前述のスクリーン版型におけると同様に、マークと図柄との位置関係を考慮したものとなっている。

【0041】以上により、搬送ベルト(3)に設けたマーク(51)を基準にして、スクリーン版型による捺染図柄と、インクジェットヘッド(23)による捺染図柄を合致させることができる。尚、位置確認センサ(50)には、前記スポット型のセンサの他、CCDカメラ等を用いることができる。これによれば、撮像した2次元画像データを画像処理して、マーク(51)の位置を認識する。

【0042】このように、一連の操作で、即ち、布帛(F)を搬送ベルト(3)に貼着させたまま、一度も剥離することなく、順次有版捺染と無版捺染とを行うことにより、容易に両捺染における図柄を合致させることが

できる。

【0043】また、有版捺染と無版捺染の順序については特に制限されるものではないが、有版捺染の次に無版捺染を行えば、広範囲に捺染された有版捺染部に細かい無版捺染部を形成することができ、より複雑な細かい図柄を形成することができる。

【0044】インクジェットでは噴射する染料の色を、コンピュータ処理により容易に変更することができる。柄についても同様である。また予め色・柄を登録するか、規則的に変更パターンをプログラム化することにより、噴射毎に色・柄を容易に変更することができる。

【0045】以上詳述したように、実施例装置によれば、従来の捺染では実現できなかった以下の3点の実現を可能とする。即ち、一つ目は、スクリーン捺染またはローラー捺染などの従来の捺染方法では表現できない非常に微細なドット状の柄を含む捺染を容易に実現できることである。さらにドット密度を任意に変化させることも可能で、ぼかし柄などの多彩な中間色を表現することができる。

【0046】また、二つ目はユーザーからの要求に即座に対応した捺染が可能となることである。さらに、ユーザーの要望による柄のマイナーチェンジも可能となる。

【0047】また、三つ目は基本柄に対して常に同一物の生産しかなし得なかったものが、インクジェット捺染部の柄パターンを即座に変更することが可能になる。具体的にはユーザの好みの柄、例えばイニシャル、ワンポイントマーク等を部分的に捺染すること、さらにはそれらを組み合わせることにより、世界に唯一つしかない柄をも工業生産することが可能となる。

【0048】以上、本発明の実施例について説明したが、本発明の具体的な態様がこれに限られるものでないことは言うまでもない。特に付言するならば、上記例においては、有版捺染手段にフラットスクリーン捺染機を採用したが、ローラー捺染機、ロータリスクリーン捺染機をも採用し得る。

【0049】また、上述の例では、搬送ベルト(3)に位置調整用マークを設け、この位置調整用マークに合わせてスクリーン版型(11)及びインクジェットヘッド(23)の位置を調整する構成としたが、スクリーン版型(11)に図柄捺染部の他に位置調整用マーク捺染部を設けて、図柄とともに位置調整用マーク(51)を布帛(F)又は搬送ベルト(3)に捺染し、次いで上述の例と同様に位置確認センサ(50)により当該位置調整用マーク(51)を検知し、検知データに基づいて調整機構(27)によりインクジェットヘッドの位置を調整する構成としても良い。

【0050】また、前記インクジェットヘッド(23)の布帛(F)長手方向の長さを前記スクリーン版型(11)の捺染幅に合わせると最も時間的に効率の良い捺染を行うことができるが、現実的にはそのような大型のイ

ンクジェットヘッド(23)を製造するのが困難であると思われるので、インクジェットヘッド(23)を1〜2回走査するだけで無版捺染を完了するようにデザイン面から考慮するのが好ましい。

【0051】

【発明の効果】以上詳述したように、本発明の請求項1及び4の発明によれば、色数の少ない大柄の部分を有版捺染手段により捺染し、色数の多い小柄の部分を無版捺染手段により捺染することにより、無版捺染手段のみにより捺染する場合に比べて生産性が格段に向上する。また、有版捺染を大柄に設定すれば、より少ない日数で捺染用版を製作することができる。更に、大柄の捺染用版を共通使用し、小柄の無版捺染部の柄のみを変化させて多種類の色柄を捺染すれば、更に生産性が向上するとともに、顧客の短納期の要請に十分に 대응することができる。

【0052】また、請求項2、3、5、6及び7の発明によれば、有版捺染柄に対する無版捺染柄の位置関係を常に正常に保って捺染することができるので、捺染される図柄がずれるのを防止することができる。

【図面の簡単な説明】

【図1】本発明の一実施例に係る装置の全体を示す正面図である。

【図2】スクリーン捺染部を示す側断面図である。

【図3】無版捺染部を示す側面図である。

【図4】往復移動機構、調整機構等を示す斜視図である。

【図5】位置調整用マークを示す説明図である。

【符号の説明】

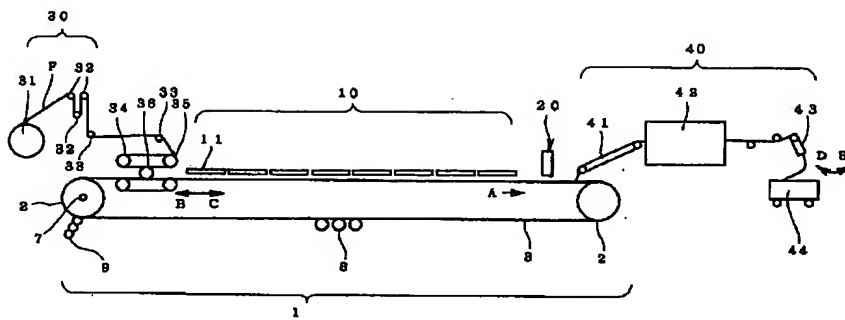
- F 布帛
- 1 搬送装置
- 2 搬送ローラー
- 3 搬送ベルト
- 7 回転移動量検出センサ
- 8 洗浄装置
- 9 糊付け装置
- 10 有版捺染部
- 11 スクリーン版型
- 12 スクリーン版型支持手段
- 13 スクリーン版型上下駆動手段
- 14 捺染のり
- 20 無版捺染部
- 21 噴射インク貯蔵タンク
- 22 供給配管
- 23 インクジェットヘッド
- 24 往復移動機構
- 25 スライド
- 26 サドル
- 27 調整機構
- 28 スライド



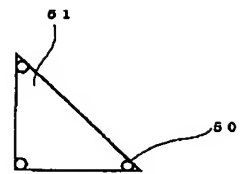
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30 供給装置  
31 繰り出し装置  
32 ダンサバー  
33 ガイドローラ  
34 同期機構  
35 同期機構  
36 貼着ローラ

40 排出装置  
41 剥離装置  
42 乾燥装置  
43 振り畳み装置  
44 台車  
50 位置確認センサ  
51 位置調整用マーク

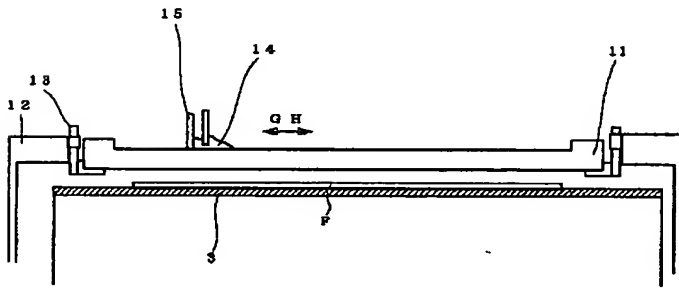
【図1】



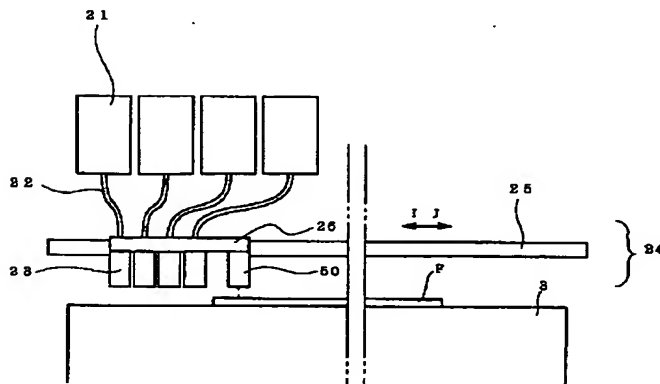
【図5】



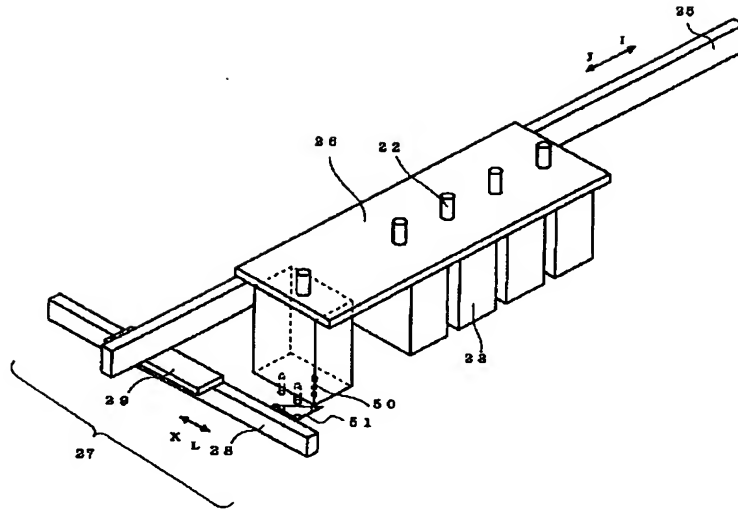
【図2】



【図3】



【図4】



フロントページの続き

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3. In the drawings, any words are not translated.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the textile-printing method which is finish-machining of a textile, and its equipment.

[0002]

[Description of the Prior Art] The \*\* version printing machine equipped with the version for textile printing of mimeograph format, such as intaglio format, such as a roller-printing machine which is looked at by the fiber handbook (editor; the Society of Fiber Science and Technology, Japan and publishing office; Maruzen Co., Ltd.), and a screen printing machine, etc. as the method and equipment which are printed to the conventional textile, and the nothing version printing machine which the applicant already indicated in Japanese Patent Application No. No. 217359 [ two to ], Japanese Patent Application No. No. 340724 [ two to ], Japanese Patent Application No. No. 88545 [ three to ], etc. are known.

[0003] The former roller-printing machine carries out transition textile printing of the printing paste of an intaglio sculpture roller on a textile by the press between the intaglio sculpture roller which the peripheral face of a drum was made to meet, conveyed the textile, and was arranged around it, and said drum.

[0004] Moreover, although a screen printing machine is further classified into a flat screen printing machine and a rotary screen printing machine, anything prints using the screen version mold which separated the color of the subject copy currently drawn with multiple color, clarified the design for every color, and was created for every color. This screen version type of configuration calls the thing of a flat tip a flat screen printing machine, and calls a cylindrical thing a rotary screen printing machine. And a flat screen printing machine pastes up a textile on an endless belt, and is made to move it with a belt. Printing paste is supplied to the flat tip screen version mold installed in the belt upper part side by side. Printing paste by SUKEJI From a screen stencil to through It has the device in which it prints on a textile. A rotary screen printing machine Like said roller-printing machine, make the peripheral face of a drum meet and a textile is conveyed. It has the device in which the printing paste supplied to the interior of the cylindrical screen-printing mold arranged around it is printed on through and a textile from a screen-printing mold by operating SUKEJI of a roller mold.

[0005] It \*\*, and according to the printing machine of the \*\*\*\*\* version, it can be printed a high speed on a textile and high textile printing of productivity can be performed.

[0006] The latter nothing version printing machine pastes up a textile on an endless belt, and is made to move it with a belt, on the other hand, a color is made to inject from the nozzle of each ink jet arm head corresponding to two or more colors, and it has the device in which it prints on a textile, and said ink jet arm head has some which installed plurality so that it may cover the thing you are made to scan by the cross direction of the textile conveyed, or full [ of a textile ]. And according to this equipment, with a screen printing machine, while being able to express the a large number color which cannot be expressed, a detailed design can be expressed.

[0007]

[Problem(s) to be Solved by the Invention] However, the above-mentioned conventional printing machine had the disadvantageous point of explaining below. namely, the defect that \*\* platemaking takes days while it has the advantage in which productivity is high, if it is in the printing machine of the \*\* version and \*\* -- it had the defect that a detailed design cannot be expressed, and the defect that \*\* expression color had a limit. And this defect had invited the result that it could not respond to various needs from the customer whom the request of a customer's short time for delivery or a feeling of a hobby diversified. On the other hand, if it was in the latter nothing version printing machine, although it was the nothing version therefore, it was short time for delivery, and while it had the advantage in which various and detailed textile printing could be performed, textile printing takes time amount, namely, it had the defect that productivity was low. This had become the constraint to the formation of short time for delivery of an abundant product as a result.

[0008] This invention is made in view of the above actual condition, and aims at offer of the textile-printing method and equipment which can respond to needs called various products and short time for delivery.

[0009]

[Means for Solving the Problem] Invention concerning claim 1 for attaining the above-mentioned purpose The \*\* version textile-printing production process of being the method of making it running a long textile continuously with a conveyance means equipped with a conveyance belt, and printing a colored pattern this textile, and printing a colored pattern this textile using a version for textile printing, Invention which makes it a summary to come to have each production process of the nothing version textile-printing production process of injecting an ink drop and printing a colored pattern, and relates to a textile after this owner \*\*\*\*\* from an ink jet nozzle at claim 2 While preparing a mark for positioning in said conveyance belt and printing a colored pattern in invention of claim 1 according to said mark for positioning in the \*\* version textile-printing production process A location of said mark for positioning is detected in said nothing version textile-printing production process, and let it be a summary to adjust and print a location of said ink jet nozzle based on this mark location. In addition, or a mode which carries out said \*\* version textile-printing production process and the nothing version textile-printing production process carries out the nothing version textile-printing production process after carrying out the \*\* version textile-printing production process, after carrying out the nothing version textile-printing production process, it may be which mode which carries out the \*\* version textile-printing production process.

[0010] In invention of claim 1, invention concerning claim 3 prints a mark for positioning a textile or a conveyance belt, subsequently detects a location of this mark for positioning in said nothing version textile-printing production process, and makes it a summary to adjust and print a location of said ink jet nozzle based on this mark location while it prints a colored pattern said textile in said \*\* version textile-printing production process.

[0011] Moreover, a conveyance means for invention concerning claim 4 to be invention of equipment, to have a conveyance belt, and to convey a long textile continuously with this conveyance belt, A supply means to supply a textile to this conveyance means, and the \*\* version textile-printing means and the nothing version textile-printing means which were established in accordance with a textile conveyance path of said conveyance means, An ink jet arm head on which it becomes from a discharge means to make a textile after textile printing discharge from said conveyance means, and said nothing version textile-printing means can blow off, and closes an ink drop, A migration device in which this ink jet arm head is made to move crosswise [ of a conveyance textile ], It makes into a summary to have had a storage means which memorized colored pattern data of textile printing, and a control means which controls actuation of said ink jet arm head and a migration device based on this colored pattern data. A reading means by which said conveyance belt in claim 4 is equipped with a mark for positioning, and, as for invention concerning claim 5, said nothing version textile-printing means detects this mark for positioning, It has an adjustment means to make said ink jet arm head and a migration device move to a longitudinal direction of a conveyance textile, and said control means processes data inputted with the

aforementioned reading means, and let it be a summary to have had an adjustment means mechanical component which controls actuation of said adjustment means. In addition, a mode which establishes said \*\* version textile-printing means and the nothing version textile-printing means may be which mode which formed said nothing version textile-printing means in the superior side, and formed said \*\* version textile-printing means in a lower part side, respectively, or it formed said \*\* version textile-printing means in the superior side and it formed said nothing version textile-printing means in a lower part side, respectively.

[0012] Moreover, while said \*\* version textile-printing means is arranged in a superior side and invention concerning claim 6 arranges said nothing version textile-printing means in a lower part side along the conveyance direction of said conveyance belt in invention of claim 4 A reading means by which said \*\* version textile-printing means is equipped with the mark textile-printing section for positioning, and said nothing version textile-printing means detects a printed mark for positioning, It has an adjustment means to make said ink jet arm head and a migration device move to a longitudinal direction of a conveyance textile, and said control means processes data inputted with the aforementioned reading means, and let it be a summary to have had an adjustment means mechanical component which controls actuation of said adjustment means.

[0013] Moreover, claim 5 or said control means in invention of 6 processes data inputted from the aforementioned reading means, and controls actuation of said ink jet arm head and a migration device based on this data, and invention concerning claim 7 makes it a summary to have had a crosswise controller which adjusts a textile-printing location in the cross direction of said textile.

[0014]

[Function] Next, an operation of this invention equipped with the above configuration is explained. First, an operation of claim 1 and invention of four is explained. according to invention of claims 1 and 4 concerned -- first -- a long textile -- a supply means -- a conveyance means -- supplying -- the conveyance belt of the conveyance means concerned -- said textile -- first -- the \*\* version textile-printing production process -- subsequently -- the nothing version textile-printing production process -- or subsequently to the \*\* version textile-printing production process, it conveys at the nothing version textile-printing production process first. It \*\* and the \*\* version textile-printing means prints it a textile in the \*\* version textile-printing production process, an ink jet arm head and a migration device are driven based on the colored pattern data which the control means of the nothing version textile-printing means memorized for the storage means in the nothing version textile-printing production process, from an ink jet nozzle, the textile concerned is made to inject an ink drop and it is printed. Subsequently, the textile after textile printing is discharged from a conveyance means with a discharge means. in addition, if the \*\* version textile-printing means prints a large-patterned portion with little color number and the nothing version textile-printing means prints a portion short in stature with much color number, compared with the case where only the nothing version textile-printing means prints, productivity will be markedly alike and will improve. Moreover, the version for textile printing can be manufactured by smaller days. Furthermore, common use of the large-patterned version for textile printing is carried out, and if only the colored pattern data memorized for the storage means of the nothing version textile-printing section short in stature is changed and the colored pattern of varieties is printed, while productivity will improve further, it can fully respond to the request of a customer's short time for delivery.

[0015] Next, an operation of claim 2 and invention of five is explained. According to invention of claims 2 and 5 concerned, the mark for positioning is prepared in a conveyance belt, and a colored pattern is printed in the \*\* version textile-printing production process according to the positioning mark concerned. On the other hand, in the nothing version textile-printing production process, the mark concerned is detected with the reading means of the nothing version textile-printing means, and the detection data concerned is inputted into the adjustment means mechanical component of a control means. Process the detection data inputted in the adjustment means mechanical component concerned, and detect the location gap in the textile longitudinal direction of the positioning mark concerned, and drive said adjustment means, shift, an ink jet arm head and a migration device are made to move to the

longitudinal direction of a conveyance textile by the amount, and the location of the ink jet arm head to the \*\* version textile-printing handle is corrected. Thereby, the physical relationship of said longitudinal direction of the nothing version textile-printing handle over the \*\* version textile-printing handle can be kept normal, and can always be printed.

[0016] Furthermore, according to invention of claims 3 and 6, first, in the \*\* version textile-printing production process, while printing a colored pattern using the textile-printing version, the mark textile-printing section for positioning prints the mark for positioning a textile. In addition, fixed physical relationship has said colored pattern and a mark for positioning. Subsequently, in the nothing version textile-printing production process, said mark for positioning is detected with a reading means, and the detection data concerned is inputted into the adjustment means mechanical component of a control means. Process the detection data inputted in the adjustment means mechanical component concerned, and detect the location gap in the textile longitudinal direction of the positioning mark concerned, and drive said adjustment means, shift, an ink jet arm head and a migration device are made to move to the longitudinal direction of a conveyance textile by the amount, and the location of the ink jet arm head to the \*\* version textile-printing handle is corrected. Thereby, the physical relationship of said longitudinal direction of the nothing version textile-printing handle over the \*\* version textile-printing handle can be kept normal, and can always be printed.

[0017] Moreover, according to invention of claim 7, positioning of the conveyance textile cross direction of the ink jet arm head concerned and a migration device is performed with positioning of the longitudinal direction of the ink jet arm head in invention of claims 5 and 6, and a migration device. That is, the data from the aforementioned reading means is processed by the crosswise controller within said control means, and the location of said cross direction of said mark for positioning is detected. Subsequently, from said ink jet arm head, it computes the what place home position of said cross direction which injects an ink drop has shifted from normal physical relationship with said mark for positioning, and, as for said crosswise controller, only the amount of gaps concerned corrects said home position. Thereby, the physical relationship of said cross direction of the nothing version textile-printing handle over the \*\* version textile-printing handle can be kept normal, and can always be printed.

[0018]

[Example] Hereafter, the example of this invention is explained based on an accompanying drawing. Drawing 1 is the front view showing one example of this invention. As shown in drawing 1, example equipment consists of the \*\* version textile-printing section (10), and the nothing version textile-printing section (20), and the exhaust (40) and the control unit (not shown) which controls actuation of each equipment. [ a feeder (30) and ] [ a transport device (1) and ]

[0019] Said transport device (1) is [ the conveyance roller (2) which separated and installed the predetermined gap as shown in drawing 1, (2), and ] this conveyance roller (2). It consists of a drive motor (not shown) which carries out an intermittent drive, and a sensor (7) which detects the amount of rotations of this conveyance roller (2). In addition, this transport device (1) is equipped with sensors (7), such as a rotary encoder, and can control the drive of said drive motor (not shown) strictly. And the washing station (8) which flushes the color which passed the textile (F) and was left behind on the conveyance belt (3), and the sizing equipment (9) which applies adhesives to a conveyance belt (3) are formed in the lower part of said conveyance belt (3).

[0020] The delivery equipment which supports the rolling-up shaft of a textile (F) around which said feeder (30) was wound in the shape of a roll free [ rotation ] to a shaft center (31), The guide idler which prevents the dancer bar (32) which keeps the tension of a textile (F) constant, and meandering of a textile (F), and is led to said conveyance belt (3) (33), The synchronization mechanism (34) and (35) which absorb the speed difference of the textile (F) supplied with the conveyance belt (3) which carries out an intermittent drive, and constant speed, On both sides of the textile (F) and the conveyance belt (3), contacted a conveyance roller (2) and (2), it comes to have the attachment roller (36) which sticks a textile (F) on a conveyance belt (3), and the attachment roller (36) and the guide idler (33) are prepared respectively free [ rotation ].

[0021] Two or more screen version molds installed in the conveyance direction of a textile (F) as said \*\*



version textile-printing section (10) was shown in drawing 1 (11), The vertical driving means which was shown in drawing 2 and which the screen version mold (11) is supported [ driving means ] and makes the screen version mold (11) concerned move up and down (13), It comes to have the support means (12) which supports the bottom driving means of besides (13), and SUKEJI (15) which contacts said screen version mold (11) upper surface, and moves in the direction of \*\*\*\* G-H. And said vertical driving means (13) consists of an air cylinder or an oil hydraulic cylinder, and is made to move said SUKEJI (15) in the direction of \*\*\*\* G-H by the air cylinder or oil hydraulic cylinder prepared separately.

[0022] As shown in drawing 3 , said nothing version textile-printing section (20) supported the ink storage tank (21), a localization sensor (50) and these ink jet arm head (23), the ink storage tank (21), and the localization sensor (50), and is equipped with the both-way migration device (24) made to move in the direction of \*\*\*\* I-J. [ an ink jet arm head (23), ] A both-way migration device (24) comes to have the saddle (26) which engaged with the slide (25) and said slide (25) movable in the direction of \*\*\*\* I-J, and the ball screw and drive motor (not shown [ both ]) which drive this saddle (26). And the ink jet arm head (23), the ink storage tank (21) corresponding to this, and the localization sensor (50) are attached to said saddle (26). In addition, in this example, while preparing yellow (Y), a Magenta (M), cyanogen (C), and four ink jet arm heads (23) corresponding to each color of black (K), four ink storage tanks (21) which stored the ink of each of said color were formed, and the ink jet arm head (23) is connected with the ink storage tank (21) which has a correspondence relation by piping (22). Moreover, an ink jet arm head (23) has two or more nozzles, has come to be able to carry out injection control of each nozzle concerned independently, and drives the nozzle concerned in response to the driving signal from said control unit (not shown). Moreover, for example, the other unit type photoelectrical sensor could be applied to said localization sensor (50), and the localization sensor (50) concerned is formed in the illustration rightmost side of a saddle (26).

[0023] Moreover, as shown in drawing 4 , the both ends of a slide (25) are equipped with the adjustment device (27). This adjustment device (27) engages with the slide (28) arranged in the direction which intersects perpendicularly with said slide (25), i.e., the longitudinal direction of a textile (F), and this, and comes to have the saddle (29) which moves in the direction of \*\*\*\* K-L, and the ball screw and drive motor (not shown [ both ]) which drive this saddle (29). It \*\* and the slide (25) of said both-way migration device (24), a saddle (26), an ink jet arm head (23), and an ink storage tank (21) move in the direction of \*\*\*\* K-L by driving this adjustment device (27).

[0024] said control unit (not shown) -- above -- said feeder -- it connects with the (30) transport-device (1) \*\* version textile-printing section (10) nothing version textile-printing section (20) and each part of the exhaust (40), and the actuation is controlled. Moreover, it can blow off and closes an ink drop while this control unit (not shown) had the storage means suitably, has memorized the data which separated the color of a predetermined pattern into this storage means, transmits the driving signal which changed this data into the radical to an ink jet arm head (23) and a both-way migration device (24) and makes the ink jet arm head (23) concerned move crosswise [ of a textile (F) ]. Moreover, said control unit (not shown) is equipped with the crosswise controller which corrects the driving signal similarly outputted to a both-way migration device (24) and an ink jet arm head (23) in response to the signal from the processing section at the adjustment device mechanical-component list which outputs a driving signal to said positioning device (27) in response to the signal from the processing section at the processing section list which processes the detection signal of said localization sensor (50).

[0025] As shown in drawing 1 , it shakes with exfoliation equipment (41) and a dryer (42), and said exhaust (40) is folded, and comes to have equipment (43) and a truck (44). Said exfoliation equipment (41) consisted of a band conveyor, and is formed in the right side edge section upper part of the transport device (1) which shows this to drawing 1 . Moreover, a dryer (42) is a heat type dryer, it shook this with exfoliation equipment (41), folded it, and has prepared it between equipment (43). Moreover, it shakes and folds, and equipment (43) is equipped with the guide rocked in the direction of \*\*\*\* D-E, and drops a textile (F) in the direction of \*\*\*\* D-E on a truck (44) with a swing.

[0026] Next, actuation of the example equipment which consists of the above configuration is explained

according to a production process.

[0027] (Textile supply production process) The adhesives first called the cloth-fulfilling agent for sticking the textile for textile printing (F) by sizing equipment (9) are applied to homogeneity on the upper surface of a conveyance belt (3). On the other hand, it is supplied on a conveyance belt (3) through a synchronization mechanism (34) and (35), without according to the feeder (30), keeping constant the textile (F) \*\*\*\*(ed) from delivery equipment (31) in tension with a dancer bar (32), and moving in a zigzag direction by the guide idler (33). And when a textile (F) passes through between attachment rollers (36), the textile (F) concerned is stuck in the condition of having stuck on the conveyance belt (3). In that case, without stretching a textile (F) superfluously, it is necessary to stick so that a wrinkle may not enter.

[0028] Since a textile (F) is \*\*\*\*(ed) with constant speed to the intermittent drive of the conveyance belt (3) being carried out at this time, at the time of a halt of a conveyance belt (3), it will be in the condition that the overage of the textile (F) was carried out, before an attachment roller (36), and slack will be produced. Then, a synchronization mechanism (34) and (35) are made to move in the direction of \*\*\*\* B-C, and the passing speed difference (namely, slack) of a textile (F) is absorbed. While the conveyance belt (3) has stopped, a synchronization mechanism (34) and (35) are made to move in the direction of \*\*\*\* B (a synchronization mechanism (34), (35), and an attachment roller (36) will move an attachment roller (36) in the direction of \*\*\*\* B, if it has connected and a synchronization mechanism (34) and (35) move in the direction of \*\*\*\* B), and, specifically, the fixed long part reservoir of the textile (F) sent is carried out. Conversely, while the conveyance belt (3) is driving, a synchronization mechanism (34) and (35) are made to move in the direction of \*\*\*\* C, and the textile (F) which was being stored is breathed out at a stretch. In addition, the technology which supplies the textile (F) conveyed continuously on the conveyance belt (3) which carries out an intermittent drive is already indicated in JP,64-7585,B etc. with constant speed in this way.

[0029] Moreover, the conveyance pitch of said conveyance belt (3) by which an intermittent feed is carried out is the same as the textile-printing width of face (width of face of a textile longitudinal direction) of said ink jet arm head (23). In addition, the textile-printing width of face in the \*\* version textile-printing section (10) serves as an integral multiple of the textile-printing width of face of said ink jet arm head (23).

[0030] (The \*\* version textile-printing production process) In the \*\* version textile-printing section (10), after said conveyance belt (3) conveys a number pitch part (part for textile-printing width of face in \*\* version textile printing) textile (F), the next actuation is made. That is, drive a vertical driving means (3), the screen version mold (11) is made to move caudad first, and the screen version mold (11) concerned is stuck on a textile (F). And the thing of the travelling direction backside descends among SUKEJI (15) of two sheets currently brought near by the edge which is one side beforehand on the screen version mold (11), and it sticks to the screen version mold (11), and moves in the one direction of the textile cross direction (for example, the direction of \*\*\*\* H shown in drawing 2), and the printing paste (14) beforehand supplied on the screen version mold (11) is scratched. The pattern of micropore is punched at the screen version mold (11), the printing paste (14) which passed the micropore reaches a textile (F), and a desired pattern is printed by the textile (F).

[0031] After SUKEJI (15) arrives at said migration direction edge, drive a vertical driving means (3), the screen version mold (11) is made to move up, and the screen version mold (11) is made to exfoliate from a textile (F). Subsequently, when an opening is made between the screen version mold (11) and a textile (F), a conveyance belt (3) is driven and a textile (F) is conveyed by the \*\* version textile-printing width of face to the next textile-printing part (lower part location of the following screen version mold). Subsequently, although the above actuation is repeated and sequential textile printing is carried out at a textile (F) Although there is also a method to which SUKEJI (15) of two sheets makes it move up, and is made to return to a predetermined location about actuation of SUKEJI (15) after arriving at a textile cross direction edge in that case It is scratching printing paste (14) by SUKEJI of an outward trip and reverse among SUKEJI (15) of two sheets about a return trip, and it is also possible to raise the productivity of textile printing.

[0032] The pattern of a desired colored pattern can be printed a textile (F) by printing using the screen version mold of two or more sheets as mentioned above. In addition, at this \*\* version textile-printing production process, a large-patterned pattern with little color number is printed.

[0033] (The nothing version textile-printing production process) In the nothing version textile-printing section (20), the next actuation is made among one period of an intermittent drive of said conveyance belt (3) (between conveyances for one pitch). That is, first, after the textile (F) has stopped, a drive motor and a ball screw (not shown [ both ]) are driven, and a saddle (26) is made to move along with a slide (25) (this is called scan). Thereby, an ink jet arm head (23) moves crosswise [ of a textile (F) ]. In the case of the migration concerned, an ink jet arm head (23) injects serially the ink supplied via piping (22) from an ink storage tank (21) to a textile (F) in response to the driving signal from a control unit (not shown), and prints a desired pattern. In addition, this ink jet arm head (23) equips the longitudinal direction of a textile (F) with two or more nozzles, and can print the shape of Rhine of predetermined width of face by one scan.

[0034] After reaching crosswise [ textile ] to the other end, there is the method of making it return to a original location by no injecting, and it is also possible to perform injection control also in the return trip of an ink jet arm head (23), if it has the function in which a control unit carries out transform processing of the pattern pattern to mirror symmetry, and to raise the productivity of textile printing. Thus, a desired pattern can be printed by making an ink jet arm head (23) scan crosswise [ of a textile (F) ] sequentially.

[0035] Moreover, multicolor textile printing is possible by preparing two or more colors of a color and ink. Usually, three colors of yellow (Y), a Magenta (M), and cyanogen (C) are used well. Furthermore, black (K) may be added. in this example, an ink jet arm head (23), an ink storage tank (21), and piping (22) were corresponded to each color of yellow (Y), a Magenta (M), cyanogen (C), and black (K) -- it has 4 sets. In addition, while according to textile printing by the ink jet arm head (23) the locus of each injection serves as halftone dot structure by the dot on a textile (F) and can express a fine line and a pattern, it can express about \*\*\*\*\*. Therefore, in this nothing version textile-printing production process, a fine pattern is printed with much color number. About an ink jet method [ make / a particle drop / inject by carrying out these colors and ink ], there are various methods as existing technology, and this can be adopted.

[0036] (Discharge production process) At this production process, the textile (F) stuck on the conveyance belt (3) by the exfoliation equipment (41) of the exhaust (40) is torn off up first. Subsequently, before shaking and folding the textile (F) which exfoliated, in order to prevent a color change, the moisture contained in the color printed with the dryer (42) is removed. And it shakes and folds, and equipment (43) is made to rock in the direction of \*\*\*\* D-E, and it shakes on a truck (44) and folds again.

[0037] Moreover, since a part penetrates a textile (F) and is storing printing paste between a textile (F) and a conveyance belt (3), after it is scratched by SUKEJI, if a textile exfoliates, printing paste will be left behind on a conveyance belt (3). A conveyance belt (3) needs to wash the printing paste (14) left behind in preparation for the cloth-fulling of the following textile (F) with a washing station (8) in order to go around. Brush sponge washes printing paste, specifically pouring warm water. Then, the adhesives which are newly pure cloth-fulling agents are applied to homogeneity on a conveyance belt (3) with sizing equipment (9).

[0038] Next, the method for doubling the pattern by the \*\* version textile printing and the pattern by the nothing version textile printing is explained.

[0039] The \*\*\*\* textile-printing section (10) and the nothing version textile-printing section (20) need to carry out handle doubling of the pattern by the \*\* version textile printing, and the pattern by the nothing version textile printing to a precision, in order to acquire a precise textile-printing pattern, since the device is separate. For that purpose, the mark (51) and ( drawing 5 ) of a rectangular equilateral triangle for alignment are first prepared on said conveyance belt (3). On the other hand, the transparent mark of a formal rectangular equilateral triangle is prepared also in the screen version mold in collaboration. And the screen version mold is set so that the mark of the screen version mold may agree

to the mark (51) of a conveyance belt (3). In addition, the mark and pattern of the screen version mold are set as fixed physical relationship.

[0040] In the nothing version textile-printing section (20), the mark (51) of said conveyance belt (3) which arrived at the reading location of a localization sensor (50) is read by the localization sensor (50) concerned. In addition, in this example, as shown in drawing 4 and 5, three other unit type sensors are provided so that it may correspond to each top-most-vertices location of a mark (51). So that it \*\*, and said control unit (not shown) may input the detection signal of this three localization sensor (50), and may process it in the processing section and all localization sensors (50) may detect a mark (51) from that result. While driving said adjustment device (27) in an adjustment means mechanical component and adjusting the location of the longitudinal direction of an ink jet arm head (23), the amount of gaps of the textile (F) cross direction of an ink jet arm head (23) is computed by driving a both-way migration device (24) in a crosswise controller. Subsequently, this crosswise controller amends the drive of said both-way migration device (24) and an ink jet arm head (23) based on the computed amount of gaps. In addition, the data memorized for the storage means of said control unit (not shown) is also a thing in consideration of the physical relationship of a mark and a pattern similarly in the above-mentioned screen version mold.

[0041] A textile-printing pattern with the screen version mold and the textile-printing pattern by the ink jet arm head (23) can be made to agree by the above on the basis of the mark (51) prepared in the conveyance belt (3). In addition, a CCD camera besides the sensor of said other unit type etc. can be used for a localization sensor (50). According to this, the image processing of the picturized two-dimensional image data is carried out, and the location of a mark (51) is recognized.

[0042] Thus, it is a series of actuation, namely, the pattern in both textile printing can be made to agree easily by performing the \*\* version textile printing and the nothing version textile printing one by one, without exfoliating also at once, while the conveyance belt (3) had been made to stick a textile (F).

[0043] Moreover, although not restricted especially about the sequence of the \*\* version textile printing and the nothing version textile printing, if the nothing version textile printing is carried out to the degree of the \*\* version textile printing, on the \*\* version textile-printing section printed broadly, the fine nothing version textile-printing section can be formed, and a more complicated fine pattern can be formed.

[0044] In an ink jet, the color of the color to inject can be easily changed by computer processing. The same is said of a handle. Moreover, a color and a design can be easily changed for every injection by registering a color and a design beforehand or programming a modification pattern regularly.

[0045] As explained in full detail above, according to example equipment, by the conventional textile printing, implementation of three points of the following which was not able to be realized is enabled. That is, blindness in one eye is that textile printing including the handle of the shape of a very detailed dot which cannot be expressed by the conventional textile-printing methods, such as screen printing or roller printing, is easily realizable. It is also possible to change dot density to arbitration furthermore, and it can express neutral colors with a variegated shading-off handle etc.

[0046] Moreover, the second is that textile printing which corresponded to the demand immediately from the user is attained. Furthermore, the minor change of the handle by request of a user also becomes possible.

[0047] Moreover, it enables that to which nothing profit always had only production of the same object, as for the third, to change immediately the handle pattern of the ink jet textile-printing section to a basic handle. It becomes possible specifically printing partially a user's favorite handle, for example, an initial, a one point mark, etc. and by combining them further to carry out industrial production also of the handle which has only one \*\* in the world.

[0048] As mentioned above, although the example of this invention was explained, it cannot be overemphasized that the concrete mode of this invention is not what is restricted to this. If it adds especially, although the flat screen printing machine was adopted as the \*\* version textile-printing means, in the above-mentioned example, a roller-printing machine and a rotary screen printing machine can also be adopted.

[0049] Moreover, although considered as the configuration which prepares the mark for positioning in a conveyance belt (3), and adjusts the location of the screen version mold (11) and an ink jet arm head (23) according to this mark for positioning in the above-mentioned example. The mark textile-printing section for positioning other than the pattern textile-printing section is prepared in the screen version mold (11). The mark for positioning (51) is printed with a pattern a textile (F) or a conveyance belt (3). Subsequently, it is good also as a configuration which detects the mark for positioning concerned (51) by the localization sensor (50) like an above-mentioned example, and adjusts the location of an ink jet arm head according to an adjustment device (27) based on detection data.

[0050] Moreover, although efficient textile printing can be performed in time if the length of the textile (F) longitudinal direction of said ink jet arm head (23) is doubled with said screen version type (11) of textile-printing width of face. Since it is considered to be difficult to manufacture such a large-sized ink jet arm head (23) actually, it is desirable to consider from a design side that the nothing version textile printing is completed only by scanning an ink jet arm head (23) one to twice.

[0051]

[Effect of the Invention] as explained in full detail above, by the \*\* version textile-printing means' printing a large-patterned portion with little color number, and printing a portion short in stature with much color number with the nothing version textile-printing means, compared with the case where only the nothing version textile-printing means prints, productivity is markedly alike and, according to invention of claims 1 and 4 of this invention, improves. Moreover, if the \*\* version textile printing is set up large-patterned, the version for textile printing can be manufactured by smaller days. Furthermore, common use of the large-patterned version for textile printing is carried out, and if only the handle of the nothing version textile-printing section short in stature is changed and the colored pattern of varieties is printed, while productivity will improve further, it can fully respond to the request of a customer's short time for delivery.

[0052] Moreover, since according to invention of claims 2, 3, 5, 6, and 7 the physical relationship of the nothing version textile-printing handle over the \*\* version textile-printing handle can be kept normal and can be printed, it can prevent that the pattern printed shifts.

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[Translation done.]

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CLAIMS

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(57) [Claim(s)]

[Claim 1] A textile-printing method of a textile which comes to have the \*\* version textile-printing production process of being the method of making it running a long textile continuously with a conveyance means equipped with a conveyance belt, and printing a colored pattern this textile, and printing a colored pattern this textile using a version for textile printing, and each production process of the nothing version textile-printing production process of injecting an ink drop to a textile after this owner \*\*\*\*\* , and printing a colored pattern it from an ink jet nozzle.

[Claim 2] A textile-printing method of a textile according to claim 1 which detects a location of said mark for positioning in said nothing version textile-printing production process, adjusts a location of said ink jet nozzle based on this mark location, and is printed while preparing a mark for positioning in said conveyance belt and printing a colored pattern according to said mark for positioning in the \*\* version textile-printing production process.

[Claim 3] A textile-printing method of a textile according to claim 1 which prints a mark for positioning a textile or a conveyance belt, subsequently detects a location of this mark for positioning in said nothing version textile-printing production process, adjusts a location of said ink jet nozzle based on this mark location, and is printed while printing a colored pattern said textile in said \*\* version textile-printing production process.

[Claim 4] Textile textile-printing equipment characterized by providing the following A conveyance means to have a conveyance belt and to convey a long textile continuously with this conveyance belt A supply means to supply a textile to this conveyance means The \*\* version textile-printing means and the nothing version textile-printing means which were established in accordance with a textile conveyance path of said conveyance means A control means which consists of a discharge means make a textile after textile printing discharge from said conveyance means, and controls actuation of said ink jet arm head and a migration device an ink jet arm head on which said nothing version textile-printing means can blow off, and closes an ink drop, a migration device in which this ink jet arm head is made to move crosswise [ of a conveyance textile ], a storage means which memorized colored pattern data of textile printing, and based on this colored pattern data

[Claim 5] The textile textile-printing equipment according to claim 4 which said conveyance belt was equipped with the mark for positioning, said nothing version textile-printing means was equipped with a reading means detect this mark for positioning, and an adjustment means make said ink-jet arm head and a migration device move to a longitudinal direction of a conveyance textile, and it had in the adjustment means mechanical component by which said control means processes data inputted from the aforementioned reading means, and controls actuation of said adjustment means.

[Claim 6] Textile textile-printing equipment according to claim 4 characterized by providing the following A reading means by which said \*\* version textile-printing means is equipped with the mark textile-printing section for positioning, and said nothing version textile-printing means detects a printed mark for positioning while arranging said \*\* version textile-printing means in a superior side and arranging said nothing version textile-printing means in a lower part side along the conveyance direction



of said conveyance belt An adjustment means mechanical component which it has an adjustment means to make said ink jet arm head and a migration device move to a longitudinal direction of a conveyance textile, and said control means processes data inputted from the aforementioned reading means, and controls actuation of said adjustment means

[Claim 7] Textile textile-printing equipment [ equipped with a crosswise controller which said control means processes data inputted from the aforementioned reading means, controls actuation of said ink jet arm head and a migration device based on this data, and adjusts a textile-printing location in the cross direction of said textile ] according to claim 5 or 6.

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[Translation done.]

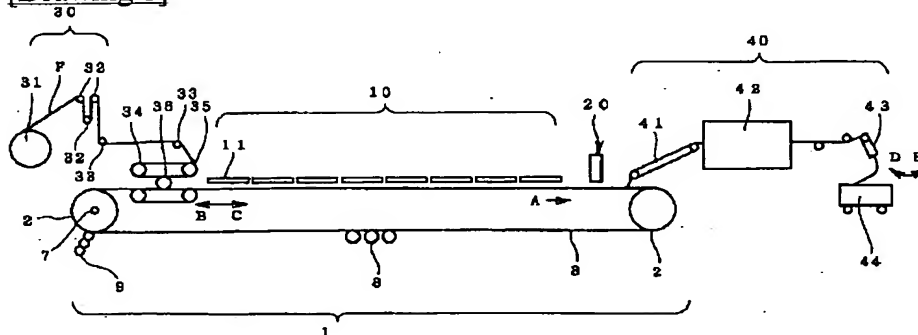
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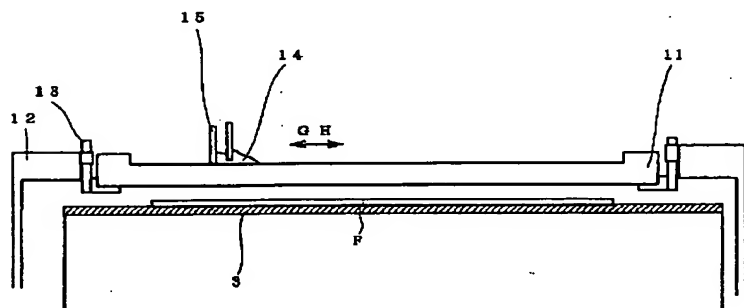
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## DRAWINGS

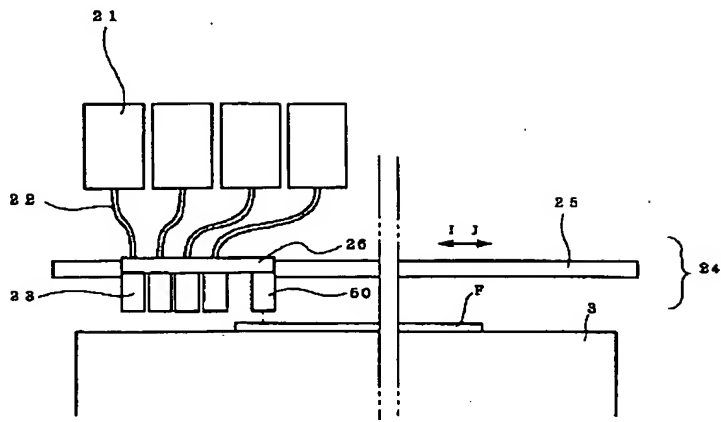
[Drawing 1]



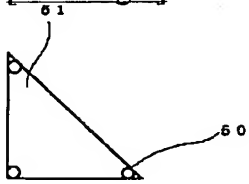
[Drawing 2]



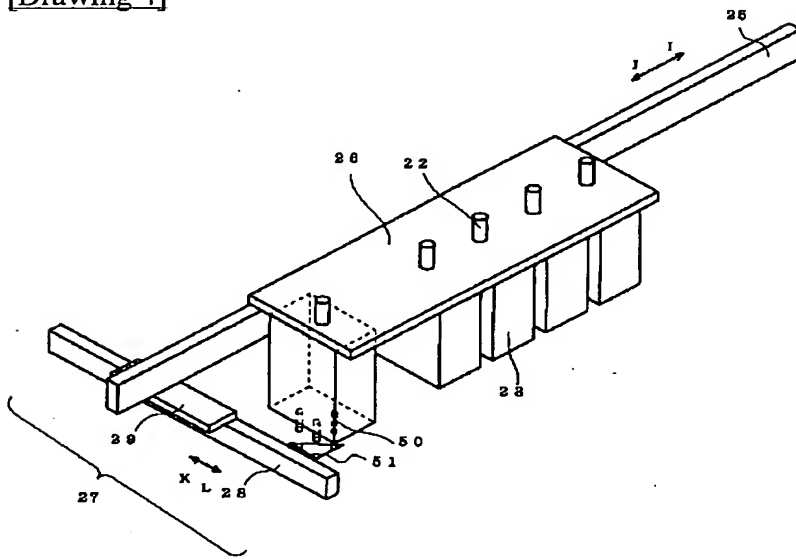
[Drawing 3]



[Drawing 5]



[Drawing 4]



[Translation done.]